

## **ARTICLE 19**

PCT/CA2004/001454

### **AMENDED CLAIMS**

received by the International Bureau on 07 March 2005 :  
claims 1 to 15 are replaced by new claims 1 to 17

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE  
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A unitary hollow structural member for a vehicle frame, said structural member having a main body portion and an end section integrally formed with said body portion, said end section being adapted to be deformed for absorbing energy from an impact, and wherein, with respect to the main body portion, said end section is tapered to provide a gradually decreasing cross sectional area.
2. The structural member of claim 1 wherein said member main body portion has a first wall thickness and said end section has a second wall thickness and wherein said first wall thickness is greater than said second wall thickness.
3. The structural member of claim 1 wherein said end section has a gradually reduced wall thickness.
4. The structural member of claim 1 wherein said structural member comprises a vehicle frame side rail, cradle, or pillar.
5. The structural member of claim 2 wherein said structural member comprises a vehicle frame side rail, cradle, or pillar.
6. A unitary hollow structural member for a vehicle frame, said member having a weakened end section for absorbing energy by deformation on application of a force and being provided with an initiation site for initiating said deformation;
  - wherein said end section is provided with a reduced wall thickness thereby rendering the end section weaker than the remainder of said member; and
  - wherein said initiation site comprises a tapered portion, with respect to the member, whereby said end section has a smaller cross sectional area than said member.
7. The structural member of claim 6 wherein said structural member comprises a vehicle frame side rail, cradle, or pillar.

**THIS PAGE BLANK (USPTO)**

8. A method for forming a hollow structural member for a vehicle frame having a weakened end section integral therewith for absorbing energy, said end section having a reduced wall thickness, the method comprising the steps of:
- providing the member to be formed;
  - providing a first die having an opening corresponding generally with the outer dimensions of the member;
  - providing a mandrel for cooperating with said die, the mandrel having outer dimensions greater than the interior dimensions of the member, wherein said die is capable of sliding over the mandrel with a clearance corresponding to the desired reduced wall thickness of the member;
  - placing the die over the member;
  - moving said die over a first distance from the end of the member;
  - inserting the mandrel into said hollow member;
  - moving said mandrel over a second distance from the end of the member;
  - sliding the die over the member and over the mandrel thereby causing the wall thickness of the member to be reduced when the die and mandrel are in cooperation.
  - removing the mandrel.
9. The method of claim 8 further including a step of providing a means of initiating deformation on said end section.
10. The method of claim 8 further including:
- providing a second die having a tapered opening;
  - sliding said second die over the end section of the member to force said end section to assume the shape of the second die opening;
  - removing said second die.
11. The method of claim 8 wherein said structural member comprises a vehicle frame side rail, cradle, or pillar.
12. The method of claim 10 wherein said structural member comprises a vehicle frame side rail, cradle, or pillar.

13. A vehicle frame side rail, cradle, or pillar made according to the method of claim 8.
14. A vehicle frame side rail, cradle, or pillar made according to the method of claim 10.
15. A hollow side rail frame member for a vehicle, said side rail comprising a unitary member having a main body portion and integrally formed first and second end portions, said first and second end portions corresponding to the front and rear ends of the vehicle, wherein at least one of said side rail end portions includes an energy absorbing section integrally formed with said main body portion, wherein, with respect to said main body portion, said energy absorbing section includes a reduced wall thickness and a reduced cross sectional area, whereby said at least one end portion is adapted to absorb energy and be deformed upon application of a force there-against.
16. The side rail of claim 15 wherein said at least one end portion is tapered to provide a gradually decreasing cross sectional area.
17. The side rail of claim 16 wherein said at least one end portion includes a gradually reduced wall thickness.

BEST AVAILABLE COPY  
BEST AVAILABLE COPY

**IN THE INTERNATIONAL BUREAU OF WIPO**

**Applicant:** Copperweld Canada Inc. et. al.  
**Serial No.:** PCT/CA2004/001454  
**Title:** Vehicle Frame Having Energy Management System And Method  
For Making Same  
**Filed:** August 6, 2004  
**Our Ref.:** 67534/00049

March 7, 2005

The International Bureau of WIPO  
34 Chemin des Colombettes  
1211 Geneva 20  
Switzerland

**STATEMENT UNDER ARTICLE 19(1)**  
**(Rule 46.4)**

Dear Sir:

Concurrently with the filing of an Amendment under Article 19 of the PCT, Applicant submits the following statement pursuant to Rule 46.4.

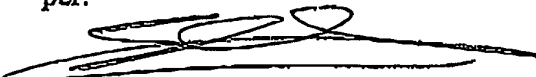
**Remarks Concerning Amendments Made**

The present application has been amended to more clearly claim the product of the invention. Further, additional claims to the product have been added. The claims to the method (original claims 11 to 15) remain unchanged with the exception of a change to the claim numbering and a correction of a clerical error in claim 15.

The Office is requested to enter present amendment to the claims and is invited to contact the undersigned should any further information be required.

Respectfully submitted,

**BLAKE, CASSELS & GRAYDON LLP**  
Agents for the Applicant  
per:



Santosh K. Chari  
Tel: (416) 863-3166  
SKC/sdb